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THE LAKES OF GLACIER NATIONAL PARK.

BY MORTON J. ELROD.

II*.

LAKE LOUISE.

The trail from Glacier Basin passes over the shoulder of Lincoln Mountain, around the shoulder of Gunsight, and drops down almost to the lake, lying at an elevation of 5,974 feet. As one rounds the angle of the mountain the lake comes into view suddenly, a beautiful sheet of water about a mile long and half as wide. High cliffs on all sides except to the south rise from the water. On the west side is a narrow strip of land which makes an admirable camping site. The first view is had from a high elevation, whichever way the traveler may be going, and is very impressive. The way leads almost to the water's edge, and a camp on the shore will be very pleasant.

We camped here early in September, 1909, staying over Sunday, September 5. Jones and I walked over Gunsight pass on the 4th. We rode from camp at Gunsight lake to the highest point on the trail where it begins to descend, before making the final ascent to the pass, the elevation being about 7,150 feet. It was a hard pull. We were both heavily loaded with big cameras and collecting material, and I was too ill to do anything but stumble along. The pass was reached about five in the evening. Lake Louise presented a most beautiful view, 1,300 feet below. A slight breeze was blowing, rippling the surface. The position of the countless small waves reflected the sun's rays directly toward the pass and in our eyes. The result was to give the lake the appearance of molten gold, brilliant at the upper central part of the water, fading outward toward the edges. So gorgeous was it that one could look at the lake only with eyes almost closed, like looking at the sun. Such a sight

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one rarely sees. It was more dazzling than sunsets on Flathead lake, which are beyond description. For a long time we sat in the pass, reveling in the splendor of the view. The cameras were brought into use, and the resulting photographs, when colored, give a fair idea of the colors, although the most brilliant tints fail to do justice to the picture. Slowly we picked our way down the rocks to the lake and to camp, avoiding the trail. A few minutes after our arrival at camp the sun sank behind the high crags to the west, and immediately the air became quite chilly.

The lake shore was searched the following day for insects, frogs, snakes, etc., and the lake waters examined for microscopic life. It was so cool that insects were scarce. Two frogs were found, one not yet fully transformed, still retaining a portion of the tail, although it was September. No snakes were seen. There were no squirrels calling in the scrubby timber. While we ate breakfast a goat was seen slowly working his way along the cliffs above us. For fifteen or twenty minutes he was in view, so close glasses were not needed, then disappeared among the rocks at the pass.

Collections of entomostraca were made from the water on the morning of September 5, 1909. The rectangular dredge was used, with butcher's linen top sewed to iron frame and fine silk bolting cloth for bag. The apparatus was thrown out as far as possible, allowed to sink, and hauled in. It was thrown out some 40 or 50 feet. At each haul the microscopic life was washed out in a large bottle, then transferred to a smaller bottle and preserved. The act of throwing out and hauling in the dredge was repeated several times until by an accident the silk net was torn, and no more collecting with it was possible.

There was an abundance of microscopic life. No attempt was made to determine the material quantitatively. Such a thing was impossible. The big red entomostracan, so abundant in Peary and Nansen lakes at the top of the rocks at Sperry glacier wall, was the most abundant species.

The results of the work with the net indicate that the lake has an abundance of entomostracan food for fish, and if young fry were planted they would doubtless do well. The lake waters fall over a cliff immediately at the outlet into a second lake 1,700 feet lower.

This lower lake is full of fish, and is a great resort for fishermen, although somewhat difficult of access. With Lake Louise stocked with fish the tourist would find it a delightful place for a camp. It is easy of access, there is plenty of wood, the scenery is very impressive, and climbing may be indulged in to the heart's content. From the high cliffs just back of camp a high waterfall breaks into spray before reaching the talus below. The stream heads in snow banks in a big basin, invisible for the cliffs. A second fall comes over the rocks above the lake, the water supplied by a small glacier just east of the pass. The trail passes at the foot of the fall, reached by an easy walk. The cliffs of Mt. Jackson, across the lake from the trail side, are high, abrupt and very impressive.

Botanizing is good. While the timber is short and scrubby, it is nevertheless quite abundant, every shelf and protected place supporting its clump or clumps of trees. The patches of timber here and there among the cliffs give them added beauty, and show where the shelves of rock are, and often indicate a way up, if one is inclined to prospect. Mosses, lichens, and ferns, as also alpine water loving plants, abound among the rocks and in the crevices along the water courses or on the scree or talus below the snow beds or ice. Insects are doubtless abundant on warm days, although at the time of our visit scarce because of the lateness of the season. Frost was on the ground in quantity the morning of September 5. We were not searching for insects, but from the character of the country and its location they are surely abundant.

The depth of the lake was not then determined. So far as then known no boat had been placed on its surface. In 1910 we planned to visit the place again when provided with a canvas boat, but plans miscarried, and the visit was not made. From appearances it is quite deep. It surely does not freeze to the bottom, and fish would undoubtedly find a quiet home and do well.

From Glacier Basin to Lake Louise is about three hours, more or less. Fish fry transported to Lake Louise would be attended to last at Glacier Basin, as there is no water between that place and Lake Louise. It does not seem a difficult task to stock the lake with fish. It is large enough to furnish a home and food for a large number. They would be confined to the waters of the lake, as there

is no portion of either the inlet or outlet which fish could travel. But that makes little difference. Now that the lake is a part of a government reserve it should be stocked with fish for the benefit of the thousands who will doubtless camp on its shores. The traveling public visiting the park will surely visit the lake in large numbers, for it is one of the scenic spots of the park, is easily reached, and is a delightful place in which to linger. Nansen, Peary and Louise may be attended to at one planting. Gunsight, across the divide, may be stocked from the other side, via St. Mary lake.

In 1911 I made another trip through the Park and stopped over night at Lake Louise. We worked on Gunsight lake in the forenoon, packed up just after lunch, started up the trail to the pass about two in the afternoon, and made camp at Lake Louise about six. The day, August 23, was one of the most perfect of the entire trip. Owing to the high cliffs of Gunsight west of the lake the sun sets early. The lake was in shadow when we arrived at its shore, but the golden summit of Jackson was brilliant in the evening sunlight, and the distant summits to the south, outside the Park limits, had an unusual clearness of form and outline.

While the boys made camp and the cook prepared dinner I put the canvas boat together. The job for me took forty minutes, the best record for the summer. After the evening meal Duffy, our cook, and myself hastened out on the lake. I wished to do the work before darkness came on.

The surface net only was used. Near shore no great abundance of life was found. In the middle, where the water was deepest, one drag of a few hundred yards resulted in almost filling the little bucket of the net with the blood red entomostraca and a clear, transparent species in lesser numbers. One haul gave an abundance of material. There is an enormous amount of life in the lake. Owing to the lateness in the day and the depth of the water the bottom dredge was not used.

The depth of the lake is as follows:

Upper end, 200 yards off shore, 88 feet.

In the middle, half way down, 118 feet.

Almost two thirds down, 244 feet.

Water temperature, 40 F.

Air temperature, 52 F.

Time, 7:30 p. m., August 23, 1911.

A lake as large as Louise, with a depth of 244 feet, will support a large amount of fish life, even though they may be confined to the waters of the lake. The lake has an elevation of 5974 feet, 698 feet higher than Gunsight, 2119 feet higher than Avalanche lake, 1501 feet higher than the upper St. Mary, and 1113 feet higher than McDermott. It is 599 feet higher than Hidden Lake, which is 2231 feet above Lake McDonald. Louise is therefore 2830 feet, or a little more than half a mile, above Lake McDonald.

But Louise is in a basin on the south side of Gunsight pass, exposed to the southern sun. Although the sun rises late and sets early for the lake surface, it nevertheless shines with powerful effect during every day when not obscured by clouds. This would not be true of Avalanche, Hidden or Gunsight lakes. The snow around the lake and on the slope of the pass must melt early in the spring, hastening the breaking of the ice in the lake. This melting snow will bring down quantities of food from the grass and timbered slopes above, even from the bare rocks. Although at a high elevation the lake must remain ice free quite late. The prevailing air currents are from the lower regions upward toward the pass, blowing over the lake on the way. These will carry insect life for food. They are warm currents in the fall, as proven by experiments elsewhere, and will retard freezing on the lake.

Everything considered, it seems clear that fish will live in the lake. They stand a poorer show than they would in almost any other lake examined, due to the absence of creek inlets and outlet, and to the elevation. But the lake is deep, and just now full of life. Tourists will find the lake a splendid camping site. They will enjoy the pass, the scenery, the lake, and all surrounding it, as well as any other place in the park. When they begin to camp on the lake shore and fish there is little chance of the increase of fish beyond the capacity of the lake to furnish food.

DESCRIPTION OF ILLUSTRATIONS

Plate II—Toward the summit of Mt. Jackson from Gunsight Pass, above Lake Louise. The unnamed glacier, only a part of which is visible, drains into Lake Louise. Other ice masses, similar but smaller, make up the water supply. The summit on the right is Jackson, 10,023 feet elevation. Note absence of vegetation and precipitous cliffs.

Plate III, A—Lake Louise from continental divide at Gunsight Pass. The view is to the south. The rippled surface of the water gave a beautiful golden reflection of the sun at the time the picture was taken. The water from the lake drops over cliffs 1,700 feet high. Note the precipitous rocks and scant vegetation.

Plate III, B—The outlet of Lake Louise, a portion of which is seen in the upper left hand corner. From Lake Louise in the upper left to the unnamed lake in the lower right hand corner the fall is 1,700 feet. The lower lake is full of fish, the upper lake has none.

Plate IV, A—The first view of Lake Louise from the trail from Lake McDonald as it rounds the shoulder of Gunsight mountain. Above the lake at the upper end is Gunsight Pass. The trail passes at the foot of the waterfall not far above the lake surface, winds back and forth across the broad talus slope, then around crags and through rock clefts to the pass. Mt. Jackson is on the right, Gunsight on the left. Citadel shows above and beyond the pass. Note the tremendous cliffs and portions of glaciers.

Plate IV, B—Falls above Lake Louise, from the trail. This stream is the main inlet of the lake, and comes from the glacier shown in Plate II.

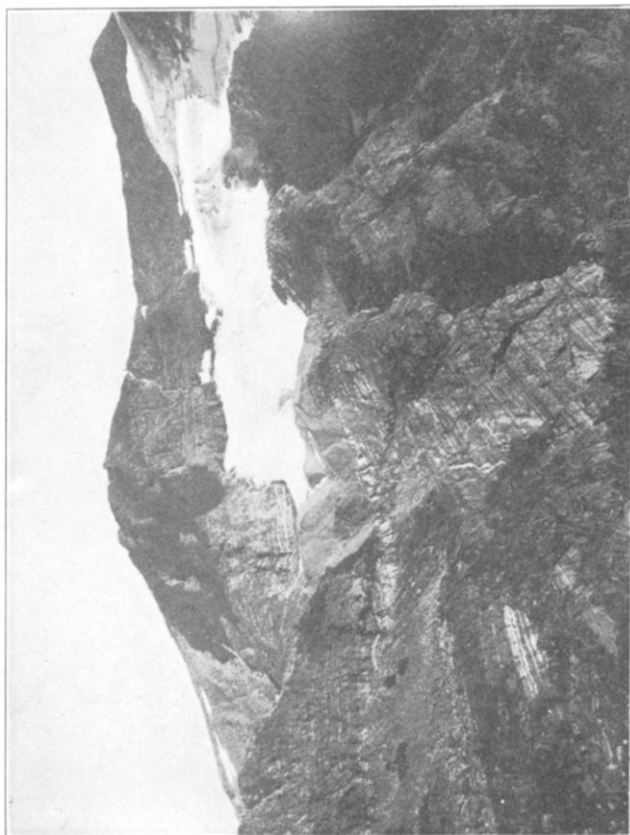
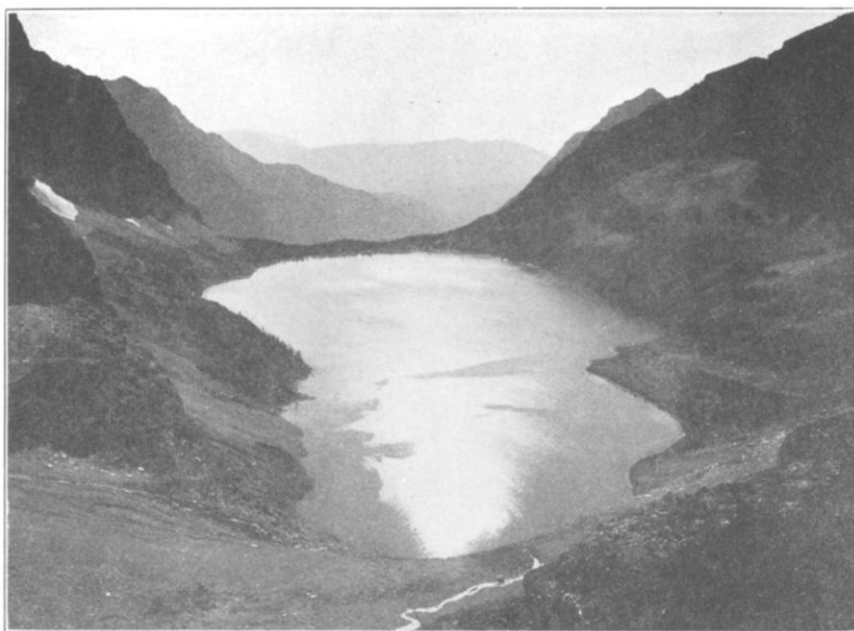
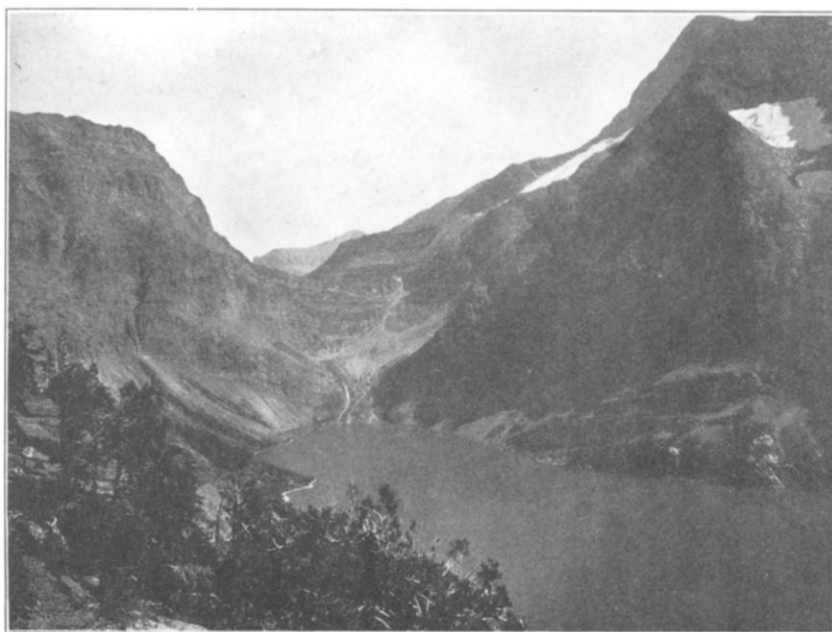


Plate II



A

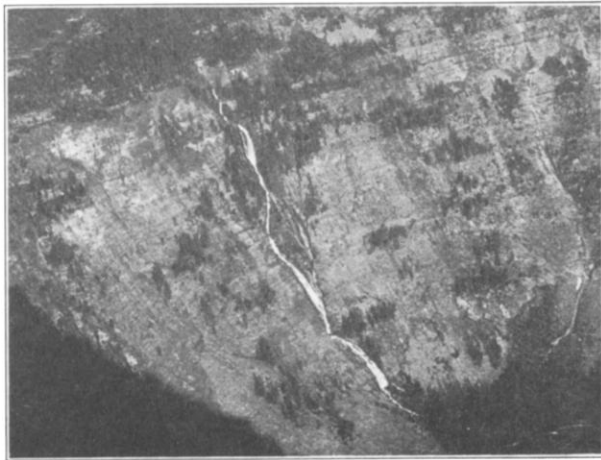


B

Plate III



A



B

Plate IV